

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (Previously Presented) A method of transferring packets from
2 communication hardware to a host computing device, the method comprising:
3 receiving a set of packets at a communication interface;
4 in a hybrid buffer of a host computing device, writing a first type II
5 completion line configured to identify a first payload buffer in which payloads of
6 a first subset of the packets are stored, wherein the type II completion line
7 includes an address or index of a payload buffer and other information common to
8 the set of packets;
9 for each packet in the set of packets, writing a corresponding per-packet
10 type I completion line in the hybrid buffer, wherein the type I completion line
11 includes information about a length of the packet, a length and a storage location
12 of a header for the packet, and other information useful for processing the packet;
13 after writing said per-packet type I completion lines, writing a type 0
14 completion line, wherein a type 0 completion line indicates that no more packets
15 are currently stored following the address or index indicated in the type II
16 completion line;
17 signaling the host computing device that a set of packets is ready to be
18 processed by configuring a single completion descriptor to identify the hybrid
19 buffer in which the completion lines were stored; and
20 at the host computing device, reading the single completion descriptor and
21 accessing the identified hybrid buffers to process the packets.
22

1 2. (Previously Presented) The method of claim 1, further comprising:
2 in the hybrid buffer, writing a second type II completion line configured to
3 identify a second payload buffer in which payloads of a second subset of the
4 packets are stored.

1 3. (Cancelled)

1 4. (Currently Amended) The method of ~~claim 3~~ claim 1, wherein said
2 completion descriptor comprises only said hybrid buffer identity.

1 5. (Cancelled)

1 6. (Currently Amended) The method of ~~claim 5~~ claim 1, wherein:
2 said first type II completion line further comprises a checksum type field
3 and a checksum start field; and
4 said checksum type field and said checksum start field apply to every
5 packet in the first subset of packets.

1 7. (Previously Presented) The method of claim 1, wherein said
2 writing a per-packet type I completion line comprises packing said per-packet
3 completion lines into the hybrid buffer.

1 8. (Previously Presented) The method of claim 7, further comprising:
2 packing headers of the packets into the hybrid buffer.

1 9. (Previously Presented) The method of claim 1, wherein each said
2 per-packet type I completion line comprises:

3 a length of a header of the corresponding packet; and
4 a length of a payload of the corresponding packet.

1 10. (Previously Presented) The method of claim 9, wherein each said
2 per-packet type I completion line further comprises:
3 an offset of the payload of the corresponding packet within a buffer in
4 which the payload is stored; and
5 a checksum of the corresponding packet.

1 11. (Original) The method of claim 1, wherein each packet in the set of
2 packets is part of the same communication connection.

1 12. (Previously Presented) The method of claim 1, further comprising
2 at the host computing device, after said signaling:
3 reading said per-packet type I completion lines until encountering said
4 type 0 completion lines; and
5 using said per-packet type I completion lines to access headers and
6 payloads of the corresponding packets.

1 13. (Previously Presented) A computer readable medium storing
2 instructions that, when executed by a computer, cause the computer to perform a
3 method of transferring packets from communication hardware to a host computing
4 device, the method comprising:
5 receiving a set of packets at a communication interface;
6 in a hybrid buffer of a host computing device, writing a first type II
7 completion line configured to identify a first payload buffer in which payloads of
8 a first subset of the packets are stored, wherein the type II completion line

9 includes an address or index of a payload buffer and other information common to
10 the set of packets;
11 for each packet in the set of packets, writing a corresponding per-packet
12 type I completion line in the hybrid buffer, wherein the type I completion line
13 includes information about a length of the packet, a length and a storage of a
14 header for the packet, and other information useful for processing the packet;
15 after writing said per-packet completion lines, writing a type 0 completion
16 line, wherein a type 0 completion line indicates that no more packets are currently
17 stored following the address or index indicated in the type II completion line; and
18 signaling the host computing device that a set of packets is ready to be
19 processed by configuring a single completion descriptor to identify the hybrid
20 buffer in which the completion lines were stored; and
21 at the host computing device, reading the single completion descriptor and
22 accessing the identified hybrid buffers to process the packet.

1 14. (Previously Presented) A computer readable medium containing a
2 data structure configured for describing multiple packets to a host computing
3 device, the data structure comprising:
4 one or more headers of packets being transferred from communication
5 hardware to the host computing device;
6 for each of the packets, a corresponding per-packet type I completion line
7 stored in a hybrid buffer, wherein the type I completion line is configured to
8 identify:
9 a length of a header of the corresponding packet;
10 a length of a payload of the corresponding packet; and
11 information configured to identify a location of the payload; a type 0
12 completion line, wherein a type 0 completion line is a null completion line used to

13 indicate no more packets are currently stored; and
14 a single completion descriptor configured to identify the hybrid buffer,
15 thereby facilitating the efficient transfer of the packets

1 15. (Previously Presented) The computer readable medium of claim
2 14, wherein each said per-packet type I completion line further comprises:
3 a checksum of the corresponding packet.

1 16. (Previously Presented) The computer readable medium of claim
2 14, wherein said data structure further comprises a payload type II completion line
3 configured to identify a second data structure in which payloads of the packets are
4 stored.

1 17. (Previously Presented) The computer readable medium of claim
2 16, wherein said information in said per-packet type I completion line comprises
3 an offset of the payload in the second data structure.

1 18. (Previously Presented) The computer readable medium of claim
2 16, wherein:
3 said payload type II completion line further comprises a set of parameters
4 applicable to each of the packets; and
5 a first parameter in said set of parameters is configured to identify a
6 checksum type.

1 19. (Original) The computer readable medium of claim 14, wherein the
2 headers are stored in fixed-sized portions of the data structure.

1 20. (Previously Presented) A computing device, comprising:
2 a communication interface configured to transfer packets from a
3 communication link to the computing device;
4 software for operating the communication interface;
5 payload memory buffers for receiving payloads of packets transferred from
6 the communication interface;
7 hybrid buffers for receiving headers of the packets transferred from the
8 communication interface and completion lines configured to facilitate processing
9 of the packets by the software;
10 a single completion descriptor configured for the communication interface
11 to use to signal the software that one or more packets have been transferred to the
12 computing device;
13 wherein said completion lines in a hybrid buffer include:
14 a payload type II completion line configured to identify a first
15 payload buffer in which payloads of one or more of the packets are stored,
16 wherein the type II completion line includes an address or index of a
17 payload buffer and other information common to the set of packets;
18 per-packet type I completion lines configured to identify locations
19 of the packets' payloads in the first payload buffer and locations of the
20 packets' headers in the first hybrid buffer, wherein the type I completion
21 line includes information about a length of the packet, a length and a
22 storage of a header for the packet, and other information useful for
23 processing the packet; and
24 a type 0 completion line, wherein a type 0 completion line
25 indicates that no more packets are currently stored following the address or
26 index indicated in the type II completion line.

1 21. (Previously Presented) The computing device of claim 20, wherein
2 said completion lines further include:

3 a type 0 completion line, where in a type 0 completion line indicates that
4 no more completion lines are stored in the hybrid buffer.

1 22. (Previously Presented) The computing device of claim 20, wherein
2 a single completion descriptor used by the communication interface to signal the
3 transfer of a first set of packets is configured by the communication interface to
4 include only the identity of the hybrid buffer in which headers of the first set of
5 packets are stored.

1 23. (Previously Presented) The computing device of claim 20, wherein:
2 said payload type II completion line further comprises a set of parameters
3 common to the one or more packets; and
4 the set of parameters comprises a checksum type.

1 24. (Previously Presented) The computing device of claim 20, wherein
2 each said per-packet type I completion line corresponds to one packet and
3 comprises:
4 a length of a header of the corresponding packet; and
5 a length of the payload of the corresponding packet.

1 25. (Previously Presented) The computing device of claim 24, wherein
2 each said per-packet type I completion line further comprises one or more of:
3 an offset of the payload in the first payload buffer; and
4 an offset of the header in the first hybrid buffer.

1 26. (Currently Amended) The computing device of claim 24, wherein
2 each said per-packet type I completion line further comprises a checksum of the
3 corresponding packet.